

**REMARKS**

This Amendment is offered in response to the Official Action of May 17, 2005. The specification and claims have been amended in accordance with the helpful suggestions of the examiner.

The allowance of claims 4, 6, 21, 23 and 28-30 subject to being rewritten in independent form is acknowledged with appreciation. It is respectfully submitted that all of the claims of the present application are allowable in view of the above amendments and the following remarks.

Claims 1, 5, 11-13, 15-18, 22 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hiyama et al. (U.S. 5,222,847) in view of Von Holst et al. (U.S. 5,487,626). This rejection is traversed. Hiyama et al. discloses a tap of a particular structure but admittedly fails to teach either steam tempering the exposed surfaces of the flank or coating the teeth of the thread-cutting structure by physical vapor deposition (PVD) of one of TiCN, TiN, TiAlCN, CrN or TiAlN/WC/C. Von Holst et al. is cited to teach these missing limitations (citing columns 1 and 2, lines 20-27 and 52-67, respectively).

However, what the Von Holst et al. reference teaches at those portions is that for high speed steel (HSS) threading taps certain surface treatments were known, namely, steam tempering, nitration or TiN coating. These are alternative treatments. The invention of that patent (cited in the present specification) was to form the threading tap of a different material (a particular compound material) and then treating at least part of the outer surface of the tap by PVD\ with a layer of TiN, Ti(C,N) and/or (Ti,Al)N. This tap is particularly useful in cutting titanium and titanium alloys. However, as disclosed herein, the known taps suffer from the drawback that

chips get entangled in the coated flutes when working in carbon steel, construction steel or stainless steel.

The threading tap of the present invention includes at least one flute having interconnected flanks having exposed surfaces that are steam tempered. The thread cutting structure can then be ground to remove the steam tempered portion) and then coated by PVD. The steam tempered flute portions are not coated by PVD but remain in the steam tempered mode for optimal chip removal.

This combination is not disclosed or suggested by the prior art. At best, the purported combination discloses a threading tap which, *inter alia*, is treated in its entirety with one of several techniques including steam tempering or a PVD coating. Such a tap is known to have its problems in working carbon steel, construction steel or stainless steel. Utilizing the specific treating of the present invention to treat specific areas of the tap to overcome these problems is not shown in the references. Steam tempering of the flute portions of the tap allows easy removal of the chips formed in threading these materials.

In addition, it is submitted that the combination of references is improper. Hiyama et al. disclose an untreated tap. Von Holst et al. disclose that HSS taps are known to be treated in their entirety in various ways and also discloses a different material with a PVD coating. Since the Hiyama et al. is silent as to the composition of the substrate, how is the skilled artisan to know which treatment is to be used? Regardless, the resulting composition is not that claimed herein.

Claims 2, 13, 19 and 20 are rejected under 35 USC 103(a) as being unpatentable over Hiyama et al. in view of Von Holst et al. as applied to claims 1 and

15 above and further in view of Matsushita (U.S. 4,507,028). This rejection is traversed.

The primary and secondary references is discussed above. Matsushita is cited to disclose certain helix angles. Even assuming it does, this reference does not satisfy the deficiencies of the earlier combination and does not enable the skilled artisan to arrive at the presently claimed invention. Withdrawal of this ground of rejection is requested.

Similarly, under 35 USC 103(a), claims 7 and 24 stand rejected over Hiyama et al. in view of Von Holst et al. further in view of Packer et al. (U.S. 6,158,304); claims 8, 9 and 26 stand over Hiyama et al. in view of Van Holst et al. further in view of Sugano et al. (U.S. 6,217,267); claims 10 and 27 stand rejected over Hiyama et al. in view of Von Holst et al. further in view of Ishii et al. (U.S. 6,220,797); and claim 14 stands rejected over Hiyama et al. in view of Von Holst et al. further in view of Fang et al. (U.S. 6,345,941). In each instance, as above, the rejection is premised on the combination of Hiyama et al. and Von Holst et al.. This combination is insufficient to teach or suggest the invention of the base claim(s) from which these claims depend. In each instance, the tertiary references do not solve the deficiencies of the combination of the primary and secondary references. Thus, these further combinations do not negate the patentability of these claims. Withdrawal of these grounds of rejection is thus requested.

Early allowance of claims 1-30 is earnestly solicited.

Respectfully Submitted,  
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